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NARRATIVE SECTION INSECT CONTROL REPORT

Brief History

In 1945 our Regional Office informed us of a bark bettle epidemic on the adjacent Caribou Forest. All field personnel were alerted and made special note of any new attacks from bark beetles during the summer field season. That fall a small survey was made in the head of Elk Creek which was the only area noted where any appreciable amount of new bug work was observed. The survey indicated an endemic condition but nothing to become alarmed about. A few scatter trees were observed in the Hawley Gulch Working Circle and these were treated by the District Ranger.

During the 1946 field season, new attacks were observed over a large portion of the Hawley Gulch Working Circle, Pine Creek, south end of Teton Basin and the Swan Valley District. The infestation was so widely scattered and of such intensity that a survey was thought necessary. The survey conducted in October 1946 indicated that there were approximately 30,000 newly infested trees and that control measures would be necessary. The 1947 control program, for which this report is written, was instigated as a result of the 1946 survey and the recommendations therefrom. Briefly, the control program recommended in the survey provided for treatment of about 17,000 trees in the Hawley Gulch unit, 6,000 trees in the Pine Creek unit, 3,000 trees in the Victor unit and 4,000 trees in the Swan Valley-Grand Canyon unit.

Plan of Action

When the deficiency appropriation was made for this control work, it was reduced so that the overall strategy had to be amended as follows: The Hawley Gulch unit and South Victor unit would receive first priority. After the control work was completed here, we would move into the Pine Creek unit with the remaining funds and reduce the intensity of the infestation by treating the larger groups of infested trees where we could get the highest production possible. In general, this was the plan that was followed.

Personnel

On May 3, 1947 we were notified that funds had been appropriated for the control work and that we could start immediately. Action was initiated on all fronts to get the project underway in the least possible time as it was realized that only a little over two months time would be available for the control work before the beetles would start emerging for their new attacks. It was estimated that approximately 220 men would be required to do the job in the time available.

The recruitment of this many men from local sources was extremely questionable so arrangements were made by the Regional Office with the Weber County Utah Farm Labor Association for 100 Mexican Nationals that were coming into the country for agricultural work. We were able to keep these men until June 20, 1947 at which time they had to be released for work in the beets. These men were split into 20-man crews and sent to five of the camps. They proved to be good steady workmen and the results we obtained were far greater than we anticipated. The language barrier did not cause the difficulties we anticipated. A few of the boys who could speak a little English were even used in the spotting crews with good success. The large majority, however, had to be employed in the treating work. It is extremely unlikely that we would have been able to recruit enough white help for this project. Although the camps were mixed on about a fifty-fifty basis, no racial difficulties were encountered. The Mexicans seemed to enjoy the work and remained in camp throughout their stay.

The balance of the men used on the work were obtained from local communities except the technical overhead which was regular forest personnel detailed to the project from other forests. Following is a list of the personnel detailed to the project and the capacity in which each was used:

David Arrivee, Payette:	Check spotter for entire project. He was later assigned Safety Officer after Bruce Groves left.
Bruce Groves, Wasatch:	Training Officer and Safety Officer. During his short assignment Bruce proved very valuable in assisting to get the camps organized and in training the overhead in control technique.
Lloyd Hague, Payette:	Work Supervisor at the Hinckley Creek Camp.
Leland Carlson, Dixie:	Chief Spotter at Hinckley Camp. When Hague left, Carlson took charge of the camp.
Hal Mickelson, Fishlake:	Chief Spotter at the Hawley Gulch Camp.
Elmer Boyle, Toiyabe:	Chief Spotter at the Mud Springs Camp.
Edward Maw, Salmon:	Work Supervisor at the Mud Springs Camp.
Elmer Taylor, Minidoka:	Foreman at the Mud Springs Camp.
Charles Enlow, Boise:	Foreman at Mud Springs Camp and later in charge of the control work at the Canyon Creek Camp.
Horace Jensen, Cache:	Chief Spotter at the Victor Camp.

Charles Middleton, Payette: Foreman at the Hawley Gulch Camp.

In addition to the above, the following Targhee personnel were assigned full time to the insect control work:

Ranger Howard Foulger:	Work Supervisor at the Hawley Gulch Camp. Foulger also took care of the "ortho" mixing station and procurement of Diesel oil.
Ranger Ernest Taylor:	Work Supervisor at the Victor Camp. Taylor also handled local procurement of supplies and recruitment of men from Teton Basin area.
Harry Dunn, Guard:	Warehouse man at Hawley Gulch and Purchasing Agent.
Joe Knotwell, Guard:	Chief Spotter at Hawley Gulch Camp.
Wally Mueller, J. F.:	Chief Spotter at Canyon Creek Camp and Work Supervisor. (Small 16-man camp)
Ray Tyson, Salmon:	Clerk at St. Anthony. Assisted with vouchers and payroll.
Dwight Hall, Bridger:	Clerk at St. Anthony. Assisted with vouchers and payroll.
Alma Richins, Guard:	Foreman at Victor Camp. Assisted Ranger Taylor in handling control work.
L. G. Woods, A.F.S.:	Project Supervisor

Without the assistance from the detailed and assigned personnel listed above, it would have been practically impossible to have carried on the project with any degree of success. It is very questionable if it is even possible to recruit locally men of the caliber needed to handle the technical jobs of spotting and camp supervision. Our Regional Forester and all divisions concerned certainly gave 100% cooperation throughout the entire project. Without such assistance and hearty cooperation, the project could not have been successfully carried on.

Local Labor

The men who were recruited locally were used primarily for the spotting, packing, strawboss, truck-driving and kitchen positions. Extremely heavy turnover in this class of personnel was encountered throughout the project. This resulted in a constant training program and a very undesirable situation because of the fluctuation in camp numbers. To

try and offset this condition, we attempted to serve very good meals and constructed comfortable semi-permanent tent camps. We feel certain that the turnover in personnel would have been much greater if this had not been done.

Safety

Safety was recognized as an item of paramount importance so high priority was given to this activity. Bruce Groves was assigned as Safety Officer for the entire project and functioned as a safety training officer at the various camps. Foremen, strawbosses and laborers were given safety instructions in all phases of the work with emphasis placed on the treating job when edged hand tools were used.

Periodic follow-up on safety occurred throughout the job. Many media, such as posters, letters of instruction, etc., were employed; also, on-the-job safety discussions and training. In some camps, the work supervisor held weekly safety training meetings with all camp personnel present. In others, a continuing program of on-the-job safety training was used. In general the results obtained were good. There is, however, still room for improvement.

Camp Equipment

Camp equipment was obtained on a rental basis from Region One. These camps were cargoed as 33-man units and had been used for Blister Rust control work. Forest Service transport trucks were used to haul the equipment to the project from Spokane, Washington. The first truck load of equipment arrived on May 5th. The construction of the tent camps began at once to provide housing facilities for the Mexican Nationals who were to arrive May 8 and for the detailed personnel who started to arrive May 6.

In setting up the tent camps, we used rough lumber for the frames and floors. Six to eight men were assigned to each 14' x 16' tent in which one heating stove was set up. Our mess kitchens were constructed with a wood frame and canvas top. They were 48' long and provided sufficient seating space so that the entire camp could eat at once. Here again the whites and Mexicans seemed to get along very well. No difficulties because of the food and different eating habits were encountered.

Subsistence Supplies

In handling the subsistence supplies, we set up a small warehouse in the garage building at Hawley Gulch and assigned Harry Dunn, one of our key guards, to this job. The initial order of staple supplies was obtained from the Region One warehouse in Spokane and arranged for through Central Purchase in Ogden. The initial perishable supplies

were purchased in the open market and from wholesale houses in Idaho Falls. Subsequent large orders were handled under regular bid procedure by Central Purchase. Fill in items and perishables were purchased by Dunn from wholesale houses in Idaho Falls through oral bid procedure. The distribution of supplies from the Hawley Gulch warehouse was handled by Dunn as ordered by the camps. No difficulty was experienced by handling our supplies in this manner. Harry Dunn did an exceptionally good job in this assignment.

Training Spotting Crews

The training camp for the chief spotters was held at Hawley Gulch. Mr. Tom Terrell from the Bureau of Entomology conducted the training and trained all chief spotters for the Targhee and Teton camps. Actual control operations were started at some of the camps on the 9th of May or the day following the arrival of the Mexican Nationals. Detailed discussion by units of the control operations, organization, transportation, etc., follow.

Hawley Gulch Unit

The bark beetle infestation in the Hawley Gulch unit was scattered throughout 15,770 acres of Lodgepole Pine host type within an area of approximately 32,000 acres. The intensity of the infestation was estimated from the survey data at 1.2 trees per acre. In actual control work we treated an average of .8 bug trees per acre. On about 1/3 of the area the infestation was only .3 bug trees per acre, on another 1/3 it was 1.2 trees per acre, and on the other 1/3 it was 1.8 trees per acre.

In organizing for the control work, we established four camps as follows: 1-80 man camp at the Hawley Gulch Ranger Station, 1-38 man camp at Hinckley Creek, 1-38 man camp at Mud Springs and 1-16 man camp in Canyon Creek. The pattern for the organization in each camp was as follows:

1 - Work Supervisor.	He was in complete charge of the entire camp. He kept all camp records including time slips, progress records, etc., and spent the balance of his time in supervision of the control work in the field.
1 - Chief Spotter.	Assigned to a five man spotting crew. He kept the camp spotting record and map. Practically all of his time was spent in the field with the spotting crew. He also acted as a check spotter on the work done by the spotting crew.
5 - Spotters.	Worked under the direction of the chief spotter. It was found that it took a full spotting crew to keep ahead of the control work.

1 - Foreman	Worked under the supervision of the Work Supervisor and was assigned to the control work. He spent all of his time with the control crews keeping them lined up and supervising the treating work. He would haul the crews to and from work and distribute them on the job. He would check off the trees treated on the camp map and keep part of the treating record.
3 - Strawbosses	Each was assigned two or three 3-man treating crews.
21 - Laborers	These men worked in the treating crews. (This was about the only work the Mexican Nationals could do.)
1 - Cook	In charge of the kitchen and mess.
1 - Second Cook	Assisted the cook.
2 - Flunkies	Assisted cook and supplied wood
1 - Truck Driver	Hauled part of the crews out to the job. Hauled oil from the mixing plant and some subsistence supplies. When not driving the truck, this man would work with the control crews.
1 - Tool Sharpener	This man would keep all the tools in the camp sharpened and in good condition. When not working on tools this man would work with the treating crews.
2 - Packers	These men handled the horses and distributed the oil to the control crews.

The above organization was found to be the most efficient size due to the fact that the Mexican Nationals could be used only for the treating work. As 20 were assigned to each camp, the balance of the organization was built around them. The 6-man spotting crew proved to be about the right size. They were able to keep ahead of the control crews so that no time was lost waiting for the spotters. Some shifting of spotting crews between camps was necessary.

During the first four weeks of the project we were unable to obtain the orthodichlorobenzene needed to mix with fuel oil for spraying so all trees treated during this period were felled, bucked into logs and burned. This method of control proved to be from 30% to 40% slower than the spraying method. For the entire project approximately 25% of the trees treated were piled and burned. After the ortho was obtained all trees treated thereafter was by the spraying method. The

trees were felled, limbed and the infested portion sprayed with the "ortho" mixture. For the application of the "ortho" mixture on the log we used a 2-gallon garden sprinkling can with a specially designed sprinkling head that would allow even application of the oil without waste. In this method of treatment a 3-man crew worked very well. Two men felling and limbing and one man spraying.

In preparing the "ortho" mixture, we set up a 1,000 gallon tank at Hawley Gulch. Into this we first placed 143 gallons of orthodichlorobenzene and then, under pressure, pumped in 857 gallons of Diesel oil. By following this procedure, we were able to obtain a good mixture of the "ortho" in the oil so that further mixing was not necessary. The ratio used for preparing the mixture was 1 part "ortho" to 6 parts Diesel oil. We were able to have the Diesel oil delivered direct to the mixing plant from the wholesale distributor. After the oil was mixed, it was distributed out to the various camps in 55 gallon drums and scattered along the roads as needed. The packers would then fill the 5-gallon jeep cans with oil from the larger drums and pack directly out to the control crews in the woods.

At the start of the project, 1½-ton stake trucks were used to haul the the men from the central camps out to work. Later we obtained six weapon carriers from the army. These units were equipped with four wheel drive and large tires enabling them to travel almost anywhere where there was room to get through. The weapon carriers were used to transport the crews to and from work and in distributing the oil. These units would travel without chains where the conventional 1½-ton trucks would get stuck with chains. They proved invaluable for this type of work.

Generally speaking, the timber types in the Hawley Gulch unit were young -mature and immature Lodgepole. It is the class of timber which we have thought in the past to be somewhat immune to insect infestation. A large percentage of the host timber was in the 80 to 120 year age class. Most of the timber was tall and quite thrifty. Of coarse the timber on fringes and in the bottoms were limby and of the "apple tree" type. The limbing or trimming of these trees was slow and costly.

The intensity of the infestations were heavy and extended 25 to 35 feet up the bole of the trees. The broods were large and extended, in many trees well into the crowns. The infested trees were generally in small groups of 3 to 8 trees each. In some of the Hinckley Creek area groups of 25 to 50 were found. In the Mud Springs area the infested trees were in singles or very small groups. In analyzing the production records for the various camps we found that the cost per tree treated was almost double when working in the widely scattered trees.

In organizing the spotting work a six-man crew was used. The chief spotter spent all of his time checking behind the spotters and keeping the men properly spaced as they traversed through the stand. Four and five chain strips were run on a grid system. Instead of blazing or marking the centerline and preparing a detailed map to show the location of each tree a new system was used with very good success. It consisted of marking the center line or control line with string or binding twine. This was layed or played out by the compassman located on the left or right wing of the five man spotting crew. When the crew reached the end

of the tape, the entire crew would pivot around the compassman and string line for the return trip. By using this method no compass line would be run on the return trip. The fellow on the other wing position would mark a guide line to check on when going back so that no parts of the stand were missed. When one of the spotters located a bug tree the compass man would give him a number to write on the blazed tree. He would then prepare a small paper tag on which was shown the number of the bug tree and the approximate location from the string line, i.e. (tree No. 234 1½ chains east). The tag was then tied to the string line. The control crews would follow up the string line until they found one of these tags showing the number of trees and just where they were located. All trees were in this manner tied into a center line in the 10 chain strip covered by the spotting crew. After this system was employed very little time was lost trying to locate bug trees. The string lines also helped to keep the treating crews from getting lost or mixed up in their directions. It was also found that the string lines also speeded up the spotting operation.

Victor Unit

The infestation in the Victor unit was confined to the southwest corner of the Teton Basin working circle. It unquestionably spread in from the Pine Creek and Rainey Creek passes. The total acreage of host type in this unit was estimated at 2,400 acres and was within an area of approximately 8,000 acres. The infestation in this unit was approximately 9/10 of a bug tree per acre.

For the control work in this unit, one camp was established in Little Pine Creek along the Swan Valley-Victor highway about one-half mile west of the divide. It was a 38-man camp and organized similiar to the camps in the Hawley Gulch unit. The method of control used in this camp was identical with that used at the Hawley Gulch camp. All of the ortho mixture was hauled in from Hawley Gulch to avoid setting up another mixing station.

The timber types in this unit were generally more mature than in the Hawley unit and were of the 80 to 120 and 120 to 160 year age class.

The topography in this unit is cut up with rather deep canyons making it far less accessible than was the Hawley Gulch unit. To cover the more inaccessible portions of the unit it was necessary to hike up to three or four miles. It was not practical to establish small spike camps to eliminate this excessive hiking because of the light infestation and widely scattered patches of host material.

Pine Creek Unit

After the control work had been completed on the Victor unit, this entire camp was shifted to the Pine Creek unit. It was possible to do this without moving the camp by transporting the men to and from work a distance of 6 to 8 miles along the Swan Valley-Victor highway. No.

attempt was made to obtain a 100% clean-up in this unit. Rather, the spotting operation was completely eliminated and all men were used in the control work. As the treating was done in this unit in July, the infested trees were heavily discolored which enabled them to be readily spotted. The strategy used in the control work here was to work only in the larger groups where maximum production could be obtained so as to reduce the intensity of the infestation to the greatest extent possible. This was deemed advisable as we knew it would be impossible to affect more than a 50% reduction with the time and funds available.

After the control work was practically completed on the Hawley Gulch unit, three 6-man control crews were shifted to the Pine Creek area and worked out of the Victor camp. Work was continued in the Pine Creek unit until July 23, 1947 at which time the beetles started to emerge for their summer flight.

The work in the Pine Creek unit was confined to the accessible patches of timber adjacent to the roads. No attempt was made to reach the more inaccessible parts of this unit in West Piney and Main Piney. A total of 2,773 trees were treated in this unit which number was approximately 45% of the estimated number.

Victor Unit (Fall Control)

Following the fall insect survey, $4,200.00 was allotted for fall control work on the Victor Unit. The survey indicated that approximately 3027 trees had been reinfested in this unit. The fall control work started October 27th and continued until November 21st. No camp was set up for this work. The men were hauled to and from Victor each day a distance of about 6 miles. Ranger Taylor was in complete charge of the work and recruited all of the personnel used from Victor or vicinity.

During the forepart of the fall control work, the trees were felled and sprayed with the "ortho" mixture. As soon as it became difficult to sprinkle the trees with the oil because of snow conditions, the trees were felled and burned. Good production was obtained throughout the entire fall program per man-day worked. A total of 1,359 trees were treated in the fall program with a total expenditure of $4,200.00 or $3.09 per tree. A crew of approximately 20 men was maintained throughout the fall work.

Buffalo Unit

A small unit west of the Stoddard Mill on Hotel Creek and Blue Creek in the Island Park area was treated by Ranger Millard and his regular improvement crew. The infestation was scattered over approximately 800 acres of mature lodgepole stands in the Stoddard Mill sale areas. A total of 80 trees were treated or 1 tree per 10 acres. The infestation in this area is considered to be a rather normal situation and entirely separated from the epidemic on the south end of the forest.

The average cost per tree for treating in this area was approximately $6.20 per tree. No separate camp was set up for the project. The "ortho" mixture used for this work was obtained from Hawley Gulch where it had already been mixed. The work was done during the latter part of June after the trees were heavily discolored. This area will be watched very closely so that we do not have a local build up occur here.

Clerical and Supply

All of the vouchering, payrolling, purchasing and related clerical work was handled by the regular office staff in St. Anthony with assistance from one clerk detailed to the forest from the Salmon. This work was handled in a very efficient manner under the direction of Glenn Petersen, Administrative Assistant. To my knowledge, all fiscal reports and related forms were submitted promptly and on time. The payrolling of all Mexican Nationals used on the Targhee and Teton Forests was handled from this office.

Recommendations

1. The Army Weapon Carriers proved to be the most efficient and economical truck unit for this type of project. Every effort should be made in the future to obtain this type of vehicle for insect control work.

2. The burning method of treatment proved to be 40% to 50% slower than the use of the "ortho" spraying method. It is therefore adviseable to carry on these insect control projects when it is possible to use the "ortho".

3. If the felling operation could be eliminated by use of a power sprayer, the cost per tree treated could be reduced considerably. Also, by speeding up production you could reduce the man-power needed and thereby eliminate the recruitment and training of large numbers of men which is a major factor in production costs.

4. In 100% coverage the use of a string line for the center control line proved to be much more efficient than the old method of marking the center lines of the strips. This would be particularly true where the intensity of the infestation ran from one to four bug trees per acre. We found that the string lines actually speeded up the spotting job as well as the treating work; also, the time spent searching for the occasional trees missed was reduced to a minimum.

5. The use of a daily record form, similar to the sample attached, eliminated several of the forms previously used such as the weekly camp managers reports and daily foreman reports. The elimination of these forms and the keeping of current accumulative reports in each camp made it possible to keep accurate check on production records for all camps. These records were reviewed periodically with the camp managers to build up competition between the camps and to analyze any production failures in the camps.

6. It is firmly believed that the use of butane gas stoves would be far less expensive for cooking than the wood burners. Even with wood quite handy the man days spent on wood detail makes it rather expensive.

7. For this project we obtained several Army surplus "ponchos" or raincoats. It is recommended that raincoats be made standard equipment for these spring projects. During the period of spring rains, if you can keep your men dry you have a lot better chance holding them on the job and you can also keep up your production average, even during the stormy days.

Respectfully Submitted,

L G Woods

LOWELL G. WOODS
Assistant Forest Supervisor

STATISTICAL DATA BY CAMPS

Item	HAWLEY GULCH				VICTOR			
	Hawley Gulch	Hinckley	Mud Spgs.	Canyon Creek	Victor Camp	Fall Work Victor Camp	Buffalo	Grand Total
Total trees spotted	4742	6245	1519	1278	1331			15115
Total acres spotted	5794	3640	5461	2940	2458		800	21093
Total man-days spotting	351	177	193	89	193		7	1010
Total man-days treating	2021	1366	787	429	1678	323	33	6637
Total trees treated	5687	5895	1618	1719	4758	1359	80	21116
(Burned)	1687	1199	766	414	913	985		5964
(Ortho)	4000	4695	852	1305	3845	374	80	15152
Gallons Ortho used	6009	4761	745	1315	3900	393	110	17233
Man-days - Equip., Supr. Supply, Camp Const.	852	284	266	133	582	47	3	2167
Grand Total Man-Days	3224	1827	1246	651	2453	370	43	9814

SUMMARY FOR PROJECT

Total expenditures for project	$142,442.00
Average cost per tree treated	$6.70
Acres spotted per man-day	21
Trees treated per man-day (treating only)	3.18
Trees treated per man-day (all personnel)	2.15
Average gallons ortho mixture used per tree	1.14
Cost of ortho mixture per gallon	$ .24
Meals served	30533
Cost of supplies	$20469.00
Cooks wages	$ 6647.00
Average cost per meal	$ 0.665
Average cost per meal including cooks	$ 0.8809
Total cost of equipment rentals (Includes hauling camps from Spokane)	$ 6819.31

S.
Control.
Insect (Bark Beetle).

PROGRESS RECORD

_____ CAMP, _____ NATIONAL FOREST. MONTH _____, 19__.

DATE	SPOTTING						TREATING											CAMP MAN DAYS		PROJECT MAN DAYS		MEALS	
	TREES		ACRES		MAN DAYS		TREES						GALLONS OIL		MAN DAYS		HORSE DAYS						
	Day	Total	Day	Total	Day	Total	Day	Total	Burned	Oiled	Spotted	Un-spotted	Fuel	Ortho-mix	Day	Total		Day	Total	Day	Total	Day	Total
1																							
2																							
3																							
4																							
5																							
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TOTALS																							

Paul J. Bieler, 1948.

ONTROL

sect (~~MOUNTAIN PINE~~ Bark BEETLE) CAMP _____ FOREST _____ YEAR 19__

DATE	SPOTTING						TREATING								CAMP OVERHEAD		GRAND TOTAL			REMARKS
	Trees Spotted	Total trees Spotted	Acres Spotted	Total Acres Spotted	Man days Spotting	Total M.D. Spotting	Man days treating	Total M.D. treating	Trees Treated	Total trees treated	Spotted trees treated	Unspotted trees treated	Trees burned	Trees treated w/ortho	Gallons Ortho Used	Man days	Total Man days	Man days	Total Man days	Horse days	

Sample Daily Progress Record For Insect Control Projects

P I C T U R E S

Snapshots taken of the Insect Control Project
Targhee National Forest
1947

Hinckley Creek Camp

C.U. Hinckley Creek Camp
Five 40 man camps were established to handle the control work. Rough lumber was used for the tent frames and floors.

Mess Hall
Tent flys were used to cover the kitchen and Mess Hall. The frame and floors were constructed from rough lumber.

Inside of mess hall. Kitchen was located in far end.

Mexican Nationals - Hinckley Creek Camp

Camp Personnel - Victor Camp

The infested trees were felled and trimmed.

The "ortho" mixture was applied with a garden sprinkling can with a special sprinkling head. Even application of the ortho was essential to obtain a good kill.

Along the roads the brush was piled and burned.

The "ortho" was sprinkled on the top side of the log only. This necessitated turning the log three or four times. The 5-gal. jeep can with spout was used to fill the sprinkling cans.

The 1000 gallon "ortho" mixing station at Hawley Gulch. All of the ortho mixture used on the project was mixed here and trucked out to the other camps.

Pack horses were used to pack the oil out to the crews from the oil dumps along the roads. Each horse could carry 4 five gallon jeep cans per load.

Tool Sharpeners were employed at each camp to keep the tools sharpened and in repair.

"Open air barber shop"

North end of Hawley Gulch unit showing scattered Lodgepole types and general topographic conditions.

Pine Creek unit showing dense stands of Lodgepole on north exposures.